

## **APPLICATION FOR**

### **UNITED STATES LETTERS PATENT**

This application is a Continuation application of co-pending U.S. Patent Application Serial No. 09/935,036 filed August 22, 2001, entitled "Trailer Rack", which  
5 claims benefit of U.S. Patent Application Serial No. 60/264,981 filed January 30, 2001, entitled "Trailer Rack", both of which are hereby incorporated by reference.

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Be it known that we, Jayson D. Stahler , a citizen of United States, residing at 3486 121 South, Murray, KY; Kenny W. Kingins, a citizen of United States, residing at 6331 St. Rt. 121 South, Murray, KY; have invented a new and useful "Trailer  
15 Rack."

### **FIELD OF THE INVENTION**

The present invention relates generally to a storage device for attachment to a livestock trailer for the transportation of dry goods and fluids with livestock. More  
20 particularly, the present invention relates to a storage rack that attaches to the top of a livestock trailer for transporting equipment, feed, and water for use with and care for the animals being transported.

## BACKGROUND OF THE INVENTION

While transporting livestock in a trailer, it is also desirable to transport items which are used with the animals or which satisfy the nutritional and physiological requirements of the animals. These items can include hay, feed, water, and equipment such as saddles, bridles, packs, veterinary supplies, spare equipment, and other material for use with or care for the animal. A good example of this need is found at horse shows or riding events which occur through the United States. A horse show may bring together large concentrations of people and animals. This large concentration can place a heavy burden on water supplies, feed supplies, or the accessibility of spare equipment and access to food or water may not necessarily be guaranteed. Thus, it is desirable to carry the feed, livestock, and equipment for the animal to the horse show. This also applies to other events such as trail rides, livestock sales, and other events where the animals are transported from one location to another. Therefore, it is desirable to have an independent and self contained trailer rack which contains food, fluids, and any necessary equipment.

It is also important that the food, fluid, and other material stored for the animals can be easily put in place by a single person of ordinary strength. Given the bulky nature and concentrated weight of items associated with the care and enjoyment of animals, the mechanisms for loading and unloading these materials are equally as important as the ability of the trailer rack to store such items. For example, horse feed is often sold in fifty pound sacks and hay bales often weigh

upwards of eighty pounds. Consequently, movement and storage of these items can be burdensome.

Thus, there is a need for a trailer rack, storage, and handling apparatus and system for attachment to a trailer which meets these needs.

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## SUMMARY OF THE INVENTION

In accordance with the present invention, a trailer rack apparatus and method is provided which addresses the drawbacks of the prior art and in one of its exemplary forms includes a two sided rack for attachment to the side supports of a trailer for carrying food, water and equipment above a trailer.

In accordance with one embodiment of the present invention, a storage rack is provided comprising first and second side supports extending from a storage chamber and attached to the sides of a trailer so that the weight of the rack, the weight of items placed into the rack, and any aerodynamic forces acting on the storage rack are transferred to the sides of the trailer.

In accordance with one example of the present invention, the unit is equipped with extended side supports so that the rack is suspended above the trailer so that roof vents on the trailer may still be used to provide airflow in the trailer.

In accordance with another example, the unit has a lifting crane to allow for the easy loading and unloading of the rack.

In accordance with yet another example, the unit is equipped with a ground level water loading, unloading, and pressurization system that allows for water to be

carried in the rack and easily accessed. One of the unique aspects of the present invention is the use of side supports of a ladder for providing the water conduits. This minimizes the weight of the system while still providing the desired functionality.

It is an object of the present invention to provide a trailer rack for attachment  
5 to a conventional livestock trailer to effectively transport dry goods and fluids.

It is a further object of the present invention to provide a storage rack for a livestock trailer so that any weight present in the storage rack or any aerodynamic forces applied to the storage rack are transferred to the sides of the livestock trailer.

A still further object of the present invention is to provide a storage rack having  
10 a storage chamber further comprising a fluid tight seal so that no precipitation enters the storage chamber.

It is an object of the present invention to provide a lifting system so that objects may be lifted to the top of the livestock trailer.

It is a further object of the present invention to provide a fluid and dry goods  
15 transportation system having a storage compartment and a fluid storage compartment attached to the frame of a livestock trailer for the transportation of dry goods and fluids. The fluid storage container includes a breather and a conduit so that fluid enters the fluid storage compartment through the conduit from a ground level and the fluid exits from the fluid storage compartment through the conduit to the  
20 ground level.

It is another object of the present invention to provide a fluid pump attached to a first conduit so that the fluid pump generates pressure to move fluid into or out of the fluid storage tank by use of the first conduit.

5 A still further object of the present invention is to provide substantially horizontal members attached a conduit for accessing the top of the livestock trailer.

These together with other objects and advantages which will become apparent reside in the details of construction and operation as more fully here and after described and claimed, with reference to the accompanying drawings forming a part thereof.

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### **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is an elevated side view of the storage rack and livestock trailer.

Fig. 2 is an isometric view of the storage rack showing the multiple storage compartments.

15 Fig. 3 is an elevated rear view of the storage rack and livestock trailer.

Fig. 4a is an elevated rear view of the fluid transportation system showing the conduit for filling and draining from the ground level.

Fig. 4b is an elevated side view of the lifting system showing the arm, winch, and cable.

20 Fig. 5 is a cross section view of the storage rack showing the fluid tight seal.

Fig. 6 is a cross section view of the fluid storage compartment.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to Figures 1-3, there is shown a storage rack **10** for a livestock trailer **12**. This rack **10** allows for food, water, and equipment for use with the livestock carried in the trailer to be transported along with the livestock. In Figure 2 and 3 there is shown the preferred embodiment in which the storage rack **10** is attached to a livestock trailer **12** having a trailer roof **14**, a first trailer side **16** and a second trailer side **18**. The storage rack **10** has a first side support **20** positioned to engage and attach to the first trailer side **16**. The storage rack **10** also has a second side support **22** positioned to engage and attach to the second trailer side **18**. The storage rack **10** also has a storage chamber **24** spanning the first side support **20** and the second side support **22** so that any weight present in the storage chamber **24** or aerodynamic forces acting on the storage chamber **24** are transferred to the sides of the livestock trailer, **16** and **18**. In the preferred embodiment, the storage chamber **24** has a bottom surface or floor **26** arranged to be located above and spaced from the trailer roof **14**. This allows for the bottom or floor **26** of the rack **10** to clear any vents or other items on the trailer roof **14**. Thus, items may be carried in the rack **10** without interfering with airflow provided by these vents. The storage chamber **24** also has a solid or mesh lid **28** covering the storage chamber **24** and movable to an open position and a closed position. A solid lid **28** is used to retain dry goods in the storage chamber and a mesh lid **28** is used when environmental conditions will not affect the items being carried.

One of the important aspects of the present invention is the transfer of forces on the trailer rack **10** to the sides of the trailer **12**. When a trailer **12** is traveling at highway speed, large aerodynamic forces are placed on the storage rack **10**. For the preferred embodiment, the storage chamber **24** attaches to the first side support **20** and the second side support **22** so that the storage chamber **24** and the connections to the trailer **12** can withstand these aerodynamic forces and remain attached when traveling at highway speed, during high wind conditions, during impact from overhanging trees and other naturally occurring events that may occur to the rack **10** during its use.

Referring now to Figures 2 and 5, there is shown the storage chambers **24**. In the preferred embodiment, the storage chambers **24** have a fluid tight seal **48**, which may be described as a solid core foam seal **48**, contacting the solid lid **28** in the closed position so that no precipitation enters the storage chamber **24**. In one embodiment, a continuous aluminum piano hinge **80** can be used to facilitate the closure of the solid lid **28**. The storage chambers **24** additionally have a gas shock or piston **30**, shown in Figure 2, the piston **30** having a first end attached to the solid lid **28** and having a second end attached to the storage chamber **24** so that the piston **30** moves or assists the movement of the solid lid **28** between an open position and a closed position.

Figure 4b shows a lifting system **32** attached to at least one of the storage chambers **24**. The lifting system **32** has an arm **34** attached to the storage chamber **24** by a lower tube **37** passing through hole brackets **39**, a wench **36** attached to the arm **34**, and a cable **38** attached to the wench **36**. The lifting system **32** should be

arranged so that the arm **34** will extend over the side **16** of the trailer **12**. The cable **38** may then be lowered to ground level. An item may be attached to the cable **38**, and the cable **38** retracted by the wench **36** to raise the item to the roof **14** of the trailer **12**. The lifting system **32** will then rotate or swing the suspended item from overhanging  
5 the side **16** of the trailer **12** to above the storage compartment **24**. The rotation of the lifting system **32** is provided by turning the lower arm **37** in the hole brackets **39**. Once the item is rotated above the storage compartment **24**, the item may be lowered into the storage compartment **24** and disconnected from the cable **38** for storage. The reverse process may be used to unload an item from the storage compartment **24**. In  
10 this manner, objects may be easily lifted to the top of the livestock trailer **12** and placed in the storage compartment **24** and later removed from the storage compartment **24** and lowered to ground level.

The lifting system **32** is designed to be compacted, folded, or stored so that it may be easily transported and used with the storage chamber **24**. For the present  
15 embodiment, the lifting system is connected to the storage compartment by lifting the entire assembly upright and placing the lower tube **37** in the hole brackets **39** attached to the storage chamber **24** as shown in Figure 2. Generally, two hole brackets **39** are used to support the lower tube in at least two places. Thus, a hole bracket **39** may be placed at the top and bottom of the storage chamber **24**. The  
20 placement of the lower tube **37** in the hole brackets **39** orients the lifting system **32** for use in loading and unloading the storage rack **24**. After use, the lifting system may be compacted by lifting the lower tube **37** out of the hole brackets **39** and placing the



lifting system **32** in the storage compartment **24**. The lifting system **32** can be folded about folding point **35** to facilitate storage of the lifting system **32**.

A fluid and dry goods transportation system **40** is disclosed by the present invention. Referring now to Figures 1, 2 and 4a, there is shown a fluid and dry goods transportation system **40** which has a livestock trailer **12**, having a first trailer side support **16**, also called a first trailer side, and a second trailer side support **18**, also called a second trailer side, and a trailer roof **14**. The trailer roof **14** has a vent **42**. The fluid and dry goods transportation system **40** has a frame **44** attached to the first trailer side support structure **16** and the second trailer side support structure **18** of the livestock trailer **12** and positioned above the trailer roof **14** of the livestock trailer **12** so that the vent **42** is not blocked.

Referring now to Figure 2, there is shown a fluid and dry goods transportation system **40** having a first storage compartment **46** attached to the frame **44** so that any weight located in the first storage compartment **46** and any aerodynamic force applied to the first storage compartment **46** are transferred to the first trailer side support **16**, also described as a first trailer side, and the second trailer side support **18**, also described as a second trailer side, of the livestock trailer **12**. The first storage compartment **46** has a solid lid **28** covering the first storage compartment **46** and moveable between an open position and a closed position. The first storage compartment **46** also has a fluid tight seal **48**, shown in Figure 5, between the solid lid **28** and the first storage compartment **46**, so that no fluid enters the first storage compartment **46** when the solid lid **28** is moved to the closed position.

Referring now to Figure 2, there is shown a fluid and dry goods transportation system **40** that has a non-fluid storage compartment **60** attached to the frame **44**. The non-fluid storage compartment **60** has a solid lid **28** moveable between an open position and a closed position. The non-fluid storage compartment **60** also has a fluid  
5 tight seal **48** between the non-fluid storage compartment **60** and the solid lid **28** so that no precipitation enters the non-fluid storage compartment **60** when the solid lid **28** is in the closed position.

The present invention is constructed of materials that are weather resistant, light in weight and structurally strong. More specifically, the weather resistant aspect  
10 of the construction material is important so that said material is not affected by any type of weather. Additionally, the lightweight nature of the construction material will reduce the load that is placed on the livestock trailer. Finally, the material must offer sufficient strength to withstand the weight of any items that are stored.

Referring now to Figures 1, 2, and 4a, there is shown a fluid transportation  
15 system **62** attached above a livestock trailer **12**. The fluid transportation system **62** has a frame **44** positioned to engage the sides of the trailer, the first trailer side **16** and the second trailer side **18** so that the frame **44** is located above and positioned from the livestock trailer **12**. The fluid transportation system **62** also has a fluid storage tank **46**, also described as a fluid storage compartment **46** or a first storage  
20 compartment **46**, attached to the frame **44** so that aerodynamic force applied to the fluid storage tank **46** and weight located in the fluid storage tank **46** are transferred to both the first trailer side **16** and the second trailer side **18**.

As shown in Figure 4A, one of the storage compartments **24** may be used as a fluid storage compartment **46** to store and transport fluids such as water. The fluid storage compartment **46** has a breather **50** to relieve excess pressure in the compartment **46** to allow for fluid overflow during pressurized filling of the compartment **46** and to allow for air to enter the compartment **46** during draining. The fluid storage compartment **46** is attached to a conduit **52** having a first end **54** and a second end **56**. The first end **54** is fluidly connected to the fluid storage compartment **46** so that the fluid enters and exits the fluid storage compartment through the conduit **52**. The second end **56** is placed at ground level to allow for easy connection to the fluid storage compartment. The second end **56** is equipped with a standard hose connection valve **58**. This valve **58** allows for easy connection to a standard garden hose or other available water supply and allows for control of water flow into and out of the fluid storage compartment **46** from a person standing at the ground level. Pressure from most water supply systems is sufficient to fill the compartment located on top of the trailer **12** from the valve **58**. The fluid transportation system **62** can also be connected to a fluid pump **64** attached to the first conduit **52** so that the fluid pump **64** generates pressure to move fluid into or out of the fluid storage tank **46** by use of the first conduit **52**. This pump **64** allows for pressurized filling of the water tank **46** from a non-pressurized source such as a stock tank, creek, or pond. The pump **64** also allows for pressurized flow out of the tank **46** for spraying off the animals or other such uses of pressurized water.

In one embodiment of the present invention, fluid transportation system **62** includes a fitting **55** and a flex hose **57** that attach to and cooperating with the first end **54** to facilitate the fluid flow to a from the fluid storage compartment **46** through the conduit **52**. The invention can also include baffles **45** located in the fluid storage  
5 compartment **46** to subdivide the fluid storage compartment **46** into multiple sections. Also, corner braces **47** can be positioned between the floor **26** and the first and second side supports **20** and **22** to provide further stability to the rack **10**. In a preferred embodiment, eight corner braces **47** are included.

In one embodiment of the present invention, the first conduit **52** is rigid. The  
10 fluid transportation system **62** also has a substantially horizontal member **66** attached to the first conduit **52** and adapted to provide vertical rungs to act as a ladder for accessing the top of the livestock trailer **12**. The fluid transportation system **62** can also have a second conduit **68** having a first end **70** and a second end **72**, the first end **70** fluidly connected to the fluid storage tank **46** so that the fluid enters the  
15 fluid storage tank **46** through the second conduit **68** from the ground level and the fluid exits from the fluid storage tank **46** to the ground level through the second conduit **68**. In another embodiment, the fluid transportation system **62** has a substantially horizontal member **66** attached to both the first and the second conduit **52**, **68** and is adapted to provide vertical rungs for accessing the top of the livestock  
20 trailer **12**.

The mechanisms used for loading the food and fluid items into the present trailer rack can be used to load material for transportation and are also reversible to

allow removal of the same. These mechanisms will allow rapid removal of items placed in the trailer rack so that removal and use of the items may occur in a short period of time. Providing the livestock being transported with the items placed in storage in the trailer rack ensures the humane transport of the livestock.

5 Additionally, if the livestock consists of racing horses or show horses, the performance of the animal may be enhanced by transport in a manner that allows access to food and/or water.

Thus, although there have been described particular embodiments of the present invention of a new and useful Trailer Rack, it is not intended that such  
10 references be construed as limitations upon the scope of this invention except as set forth in the following claims.